1948

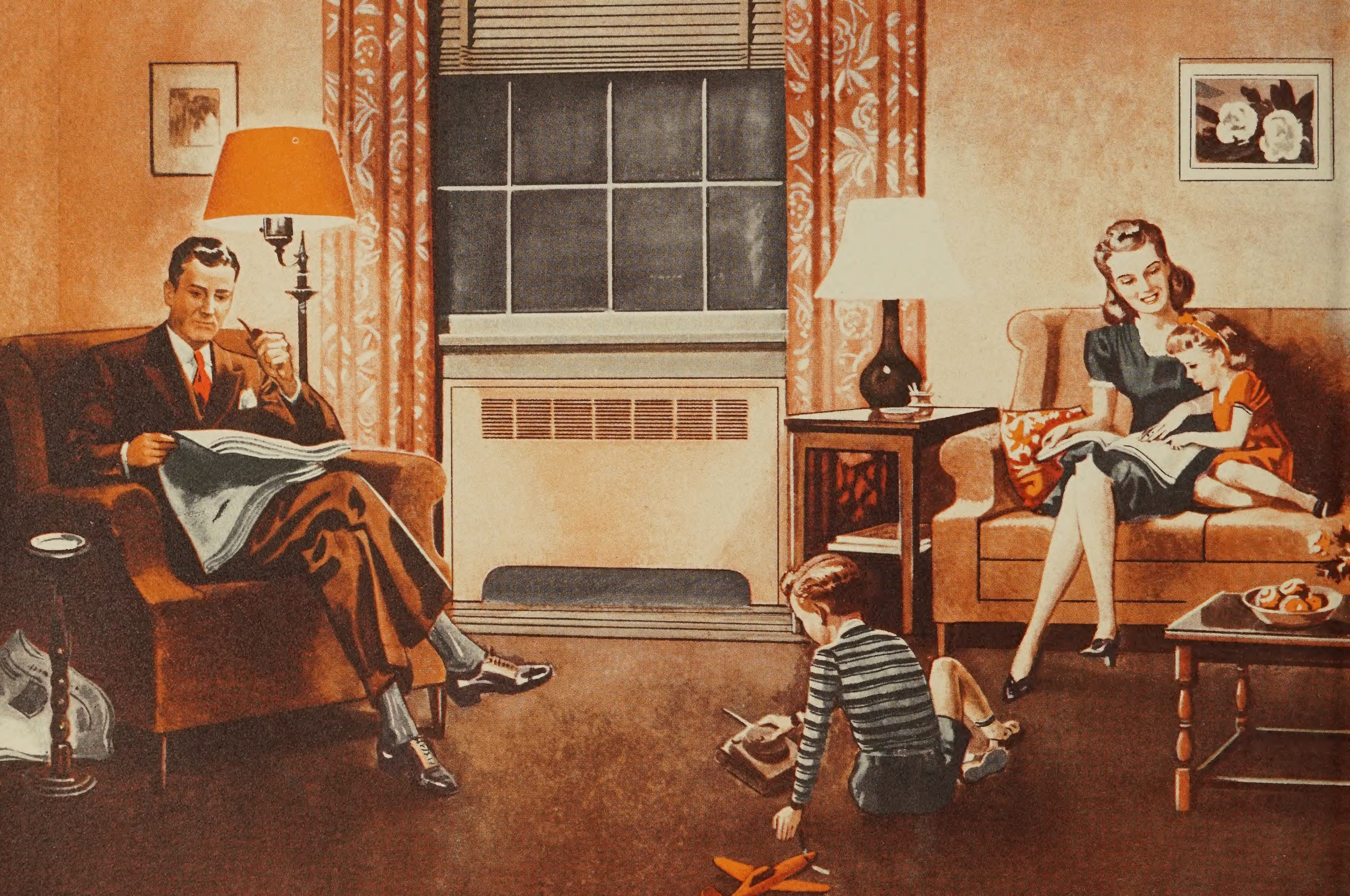
A guide to

Health
Comfort
and Economy

PLAN

TO BE COMFORTABLE

How to select the right heating system for your home



Health and Comfort

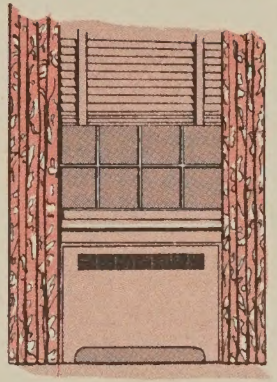
. . . top-ranking requirements for better living

Have you ever considered how much of our life is spent indoors—and how much of each year's weather calls for house heating?

Consider, too, how greatly the right indoor climate affects our ability to spend this time enjoyably—in health and comfort. Our home tasks, our recreation—in fact, all that spells living itself—bring full pleasure and profit only when winter-living conditions are right.

How important then that we don't gamble with our health or comfort—or with the heating that means so much to better living!

The essential purpose of a heating system is to compensate for the heat losses which occur constantly in fall, winter and spring, when heat from rooms passes outwardly through cold walls and window glass and other losses occur by air leakage through cracks around doors and windows. Also, when outdoor temperature is down, the heat radiated from the human body[*] is absorbed by cool wall and window areas.



Some loss of body heat is necessary to life itself but, if the body is not to feel chilled, the rate of loss must be regulated. This is done by introducing enough additional warmth into the rooms to prevent excessive losses of body heat.

Too much or too little heat is unhealthy and uncomfortable. The correct amount, when evenly distributed and controlled, gives you the full pleasure and enjoyment of living in a proper indoor climate.

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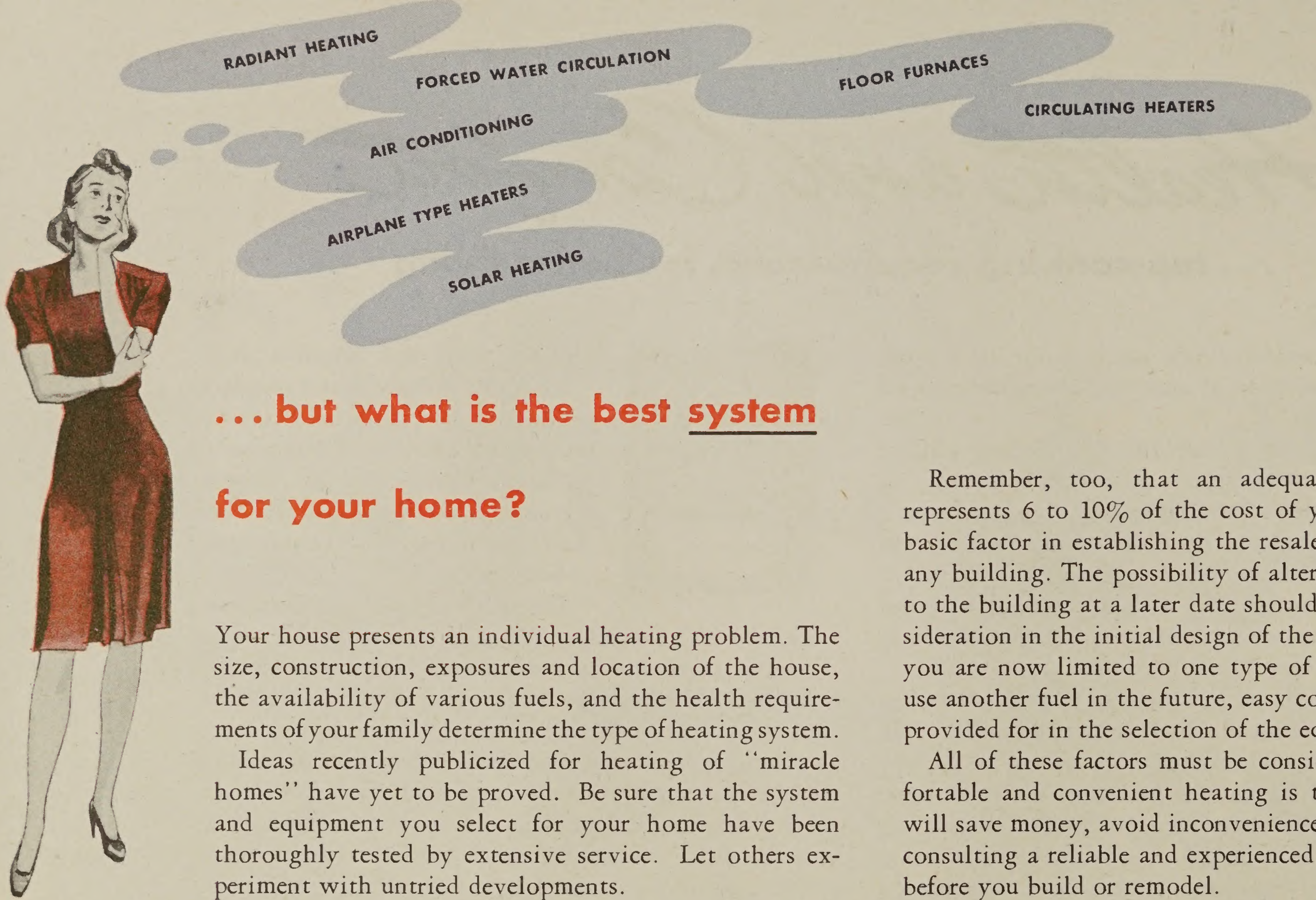
Because health and comfort—plus operating convenience and economy—will reward your selection of the right heating system, you will find it worthwhile to study the description of heating methods and types of heating systems set forth in this booklet.



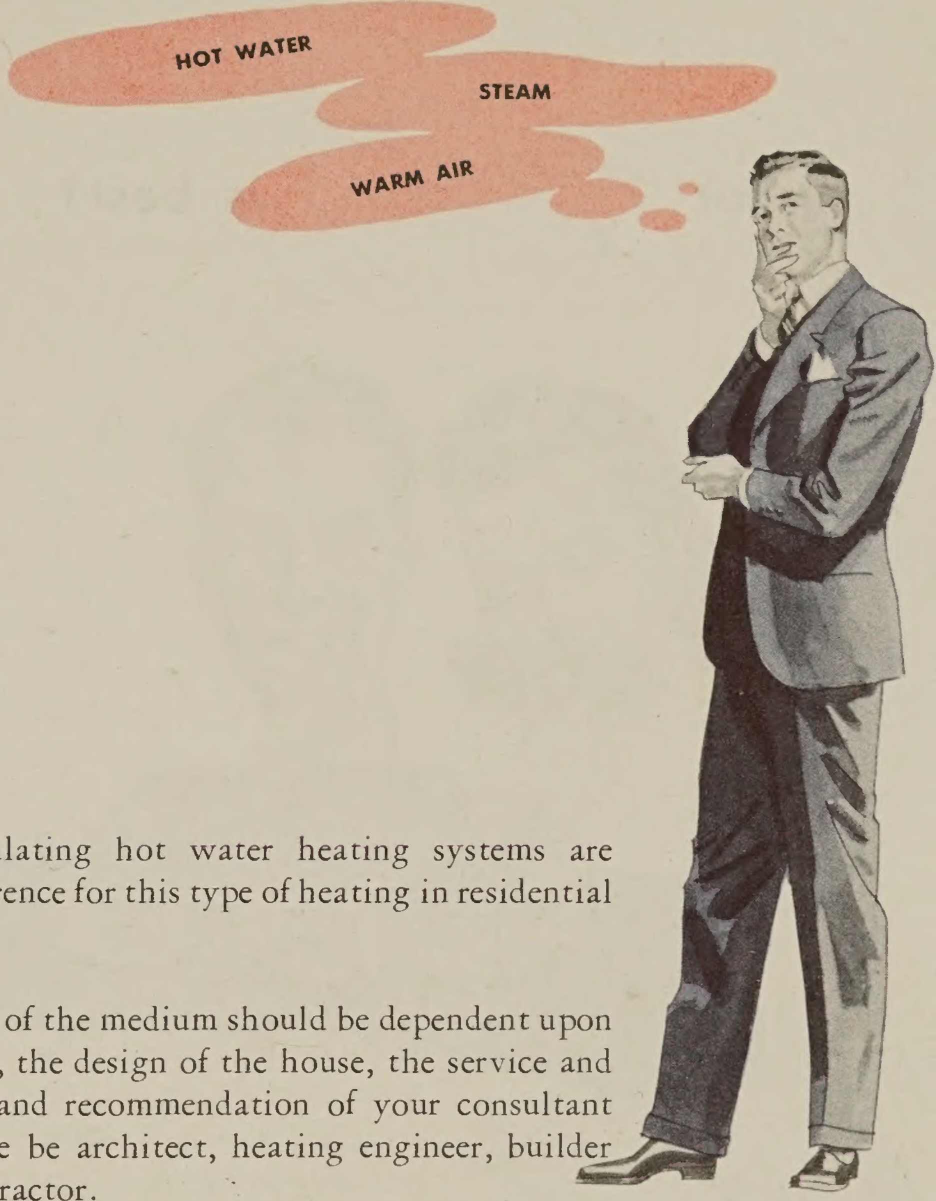
. . . but what is the best system for your home?

Your house presents an individual heating problem. The size, construction, exposures and location of the house, the availability of various fuels, and the health requirements of your family determine the type of heating system.

Ideas recently publicized for heating of "miracle homes" have yet to be proved. Be sure that the system and equipment you select for your home have been thoroughly tested by extensive service. Let others experiment with untried developments.

Remember, too, that an adequate heating system represents 6 to 10% of the cost of your home. It is a basic factor in establishing the resale or rental value of any building. The possibility of alterations or additions to the building at a later date should be taken into consideration in the initial design of the heating system. If you are now limited to one type of fuel, yet expect to use another fuel in the future, easy conversion should be provided for in the selection of the equipment.

All of these factors must be considered if fully comfortable and convenient heating is to be assured. You will save money, avoid inconvenience and discomfort by consulting a reliable and experienced heating contractor before you build or remodel.



. . . and what is the best medium?

What basic medium should be specified for conveying heat—hot water, steam or warm air? The popularity of each of these has varied in different localities—depending upon personal preference, custom and promotion.

In recent years, warm air systems, complemented with fans, filters and humidifiers, have been promoted aggressively in many parts of the country. Steam is still a favorite method in some areas and is used extensively in commercial and industrial heating. Now, improvements in forced circulating hot water heating systems are creating a preference for this type of heating in residential construction.

The selection of the medium should be dependent upon your preference, the design of the house, the service and results desired and recommendation of your consultant . . . whether he be architect, heating engineer, builder or heating contractor.

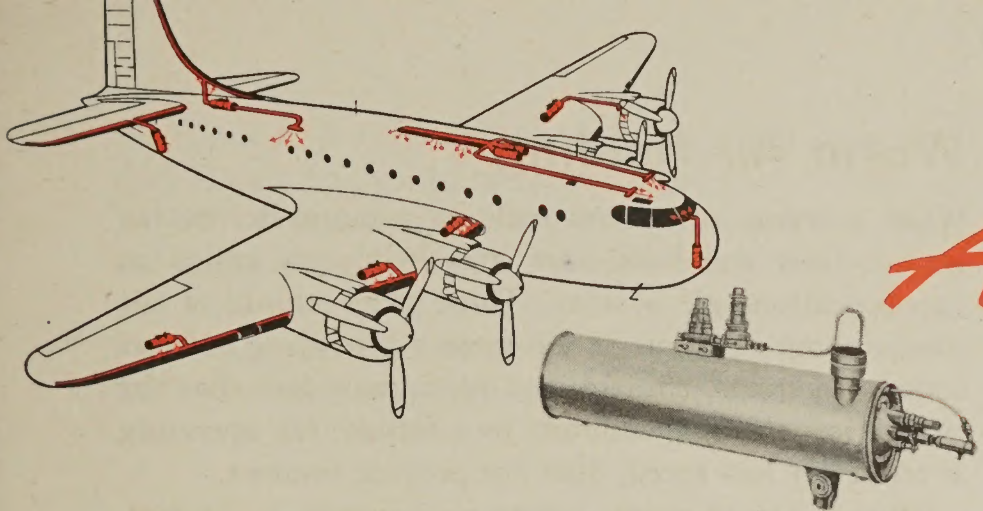
what *fuel* is best?

Wartime restrictions have made home owners more conscious of fuel supply—an experience indicating the advisability of choosing equipment which can be converted readily from one fuel to another.

The temporary shortage caused by war conditions should not be given undue importance—surveys prove that we need not fear exhaustion of any fuel for many, many years. There is the possibility, however, that we may again be faced with temporary interruptions due to strikes, war emergencies and other unforeseen conditions.

Among the factors determining fuel selection are your nearness to the source of supply of one fuel or another; whether you want to add automatic firing equipment to an existing furnace or boiler, or desire to select a completely automatic all-in-one unit. Local fuel prices, or changes in your economic status, and possible future discoveries of new sources of supply also may influence your decision.

Consequently, no one fuel can be recommended generally as being best or most economical to use.



How about Aircraft Type Heaters for Home Heating?

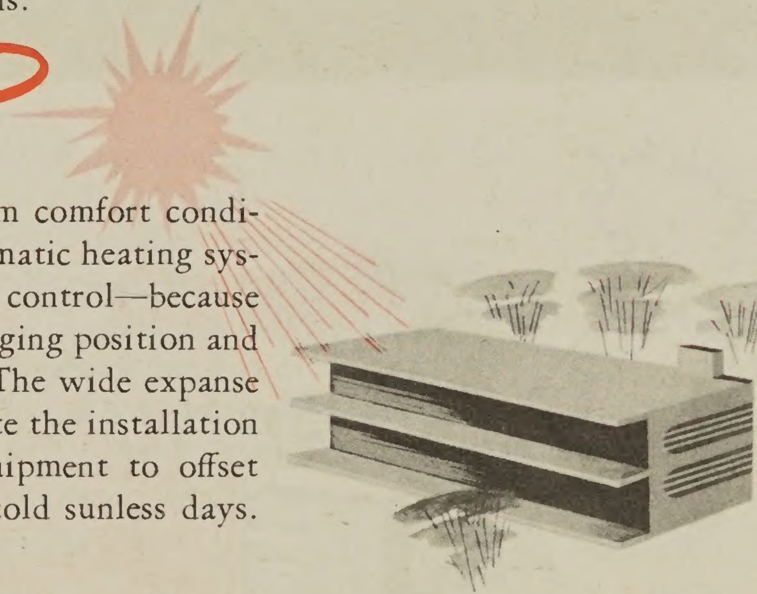
Although aircraft heaters are excellent for their designed purpose—using several heaters in each plane and burning high octane gas—their redesign for home heating presents a three-fold problem. Units must be larger if only one is used in each home; their present high velocity air-flow would be excessively noisy for home heating; fire department regulations do not permit home storage of highly volatile fuels.

The successful adaptation of this type of heater for home installations would appear to require much more development work and field testing under a wide variety of operating conditions.

. . . or Solar Radiation?

Some houses have been designed to utilize the radiant heat of the sun to supplement the conventional heating system. A house designed to take advantage of solar heat, must have large window areas with full southern exposure to admit the maximum amount of the sun's radiant rays in winter. Also, it must have specially designed extended roof eaves or other protection against solar radiation during the hot summer.

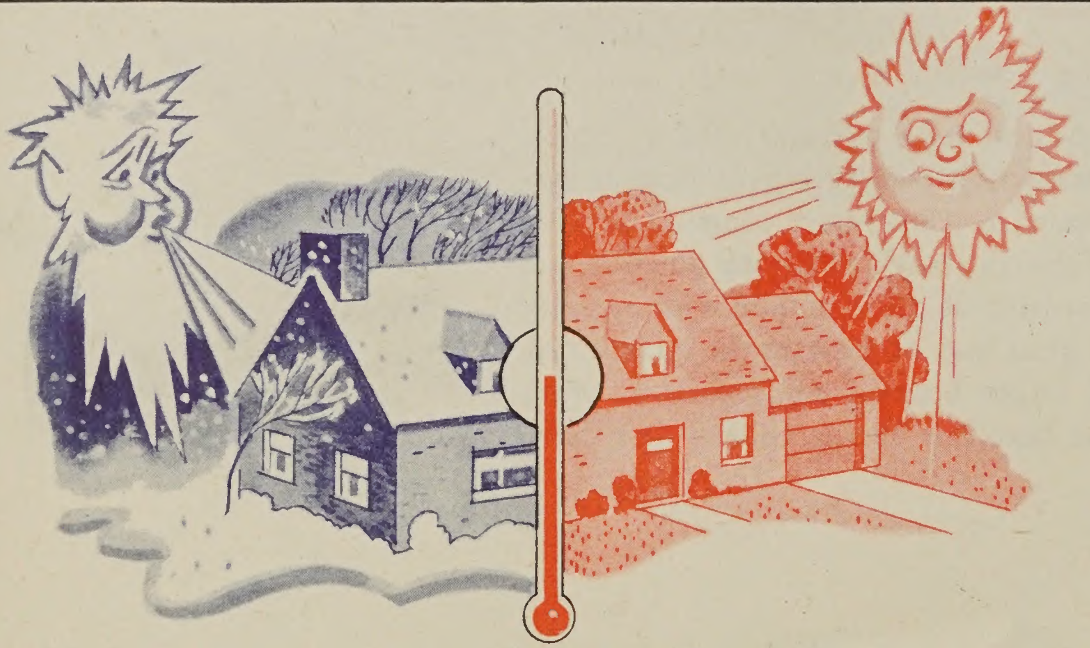
Maintaining uniform comfort conditions requires an automatic heating system with temperature control—because of the constantly changing position and intensity of the sun. The wide expanse of glass may necessitate the installation of larger heating equipment to offset the heat loss during cold sunless days.



What about

Winter and Summer

Air Conditioning?



Warm Air Heating

When a warm air system includes a motor-driven fan with a filter and humidifier it is frequently called an "air-conditioning" system. Those who think of air conditioning in terms of equipment providing summer cooling in stores, theatres and restaurants find that the circulation of air in summer, by a furnace fan operating at relatively low speed, does not provide comfort.

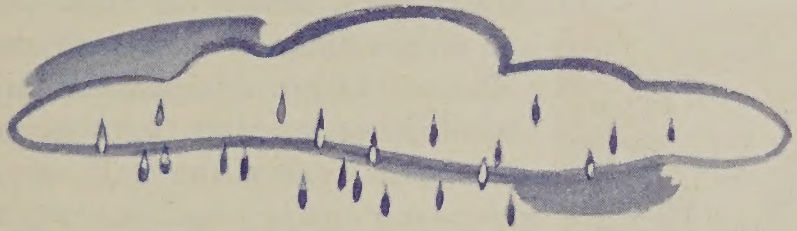
When a forced warm air heating system is selected, caution should be exercised in the proper location of the registers from which the heated air is discharged. These registers must be properly located in relation to return air openings to prevent drafts. Consideration must be given to the placement of furniture, so that sofas, desks and radio consoles do not block the flow of heated air.

For satisfactory summer cooling, when it is planned to use the air ducts of the heating system for distributing cooled air, it is advisable to install somewhat larger ducts to accommodate the greater volume of air necessary. Successful cooling may also require some changes in the location of wall registers.

Air Cleaning

The necessity for cleaning indoor air varies in many sections of the country. Homes located in industrial areas have greater need for air cleaning than homes in the country. When filters are used in a warm air system, they should be cleaned or replaced frequently if they are to be effective; otherwise they become clogged and reduce the volume of heated air distributed throughout the house.

A new method of cleaning air by passing it between electrically charged plates is very effective in removing dust, soot, pollen and odors.



Humidity

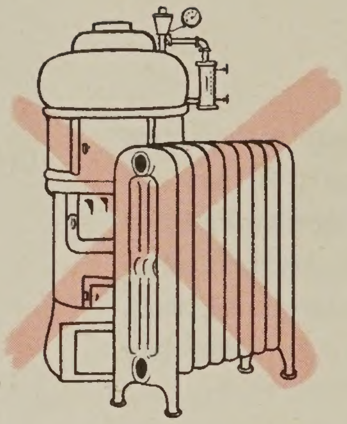
Too much emphasis has been attached to the importance of adding moisture to the air, indoors. Medical authorities have not proven that high humidity, as provided by mechanical humidification is more healthful than the normal amount of moisture obtained, in most climates, by infiltration of outside air and by vapors from cooking and washing. Except in overheated homes, more moisture is very seldom necessary. In fact, where humidifiers are used, it is important that they be automatically controlled to prevent excessive moisture causing serious damage to wall surfaces, woodwork and insulation.

Summer Cooling

Summer cooling is generally of less importance than heating in the year 'round cycle of providing ideal indoor climatic conditions. Better than half of each year finds a constant demand for heating yet cooling is desirable for only the hot sticky days—relatively few in number. Wartime needs for cooling equipment have speeded up progress in this field of engineering which may permit the peacetime introduction of more compact, less costly cooling units capable of being used with any type of heating system.

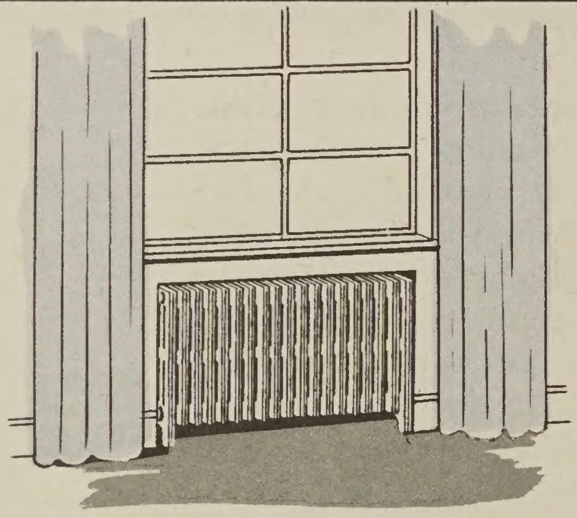
Several different types of equipment will be available to provide residential cooling comfort. A cooling coil connected to a compressor can be installed in the duct work of a warm air heating system. A house with a hot water or steam heating system can be cooled by the addition of a split system which consists of a compressor, cooling coil, filter and fan in the basement and connected to ducts for conveying cooled air to the living quarters. Separate cabinet type room cooling units can be used with any type of heating system.

Why is Modern *Hot Water Heating* Different?

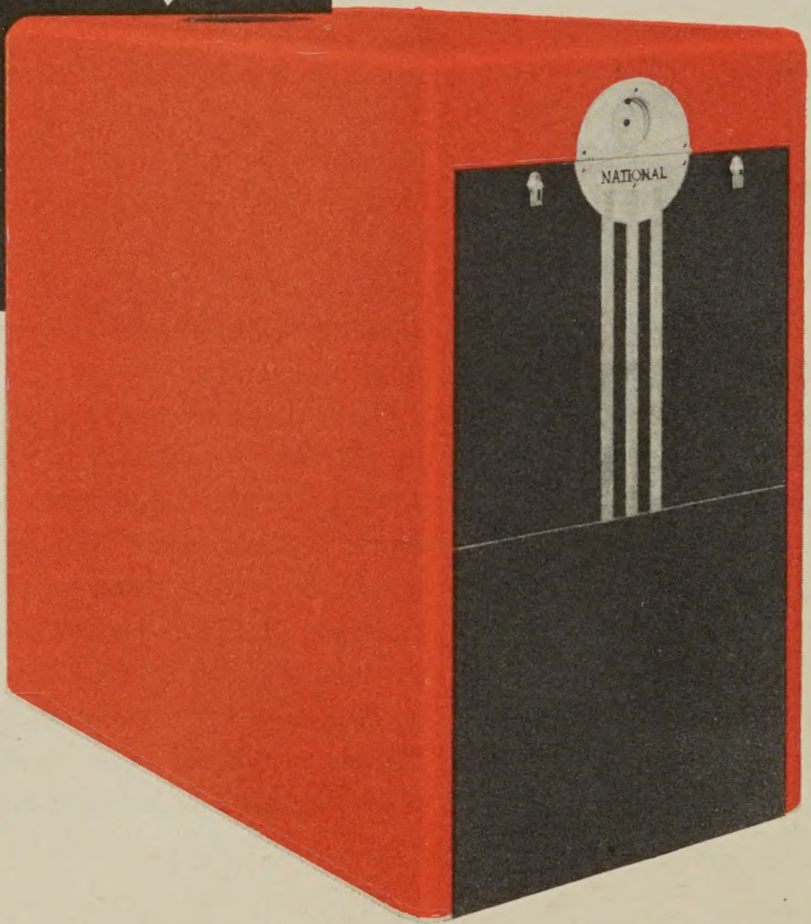


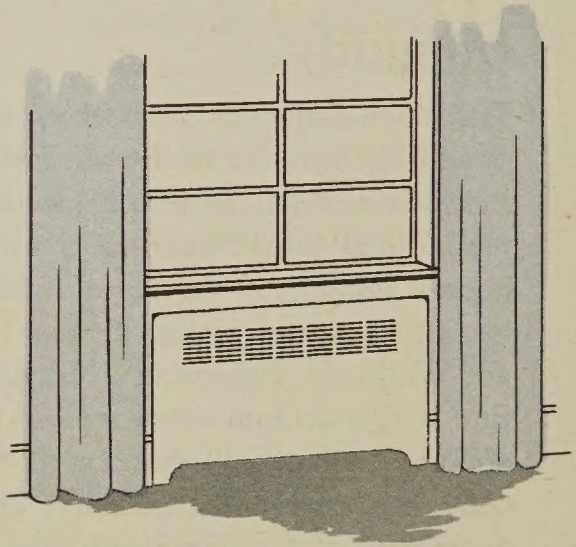
If you think of hot water heating in terms of large, bulky radiators and a big, ugly boiler, you are due for a surprise.

Today's compact, attractively jacketed, highly efficient boiler is connected to room heating units by small pipes, usually no larger than an inch in diameter. The small, more efficient radiant units recessed under windows are no more obtrusive than any other part of the wall area. A circulator pump, operated by the



Modern radiators, slender and compact, may be recessed under windows to harmonize with any decorative scheme.



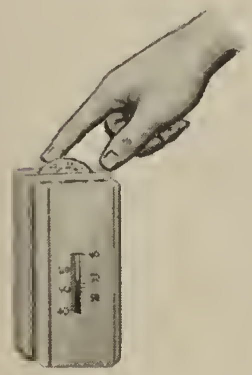


Convectors, in attractive enclosures, provide ample heating capacity in a small space and permit drapes to be arranged at will.

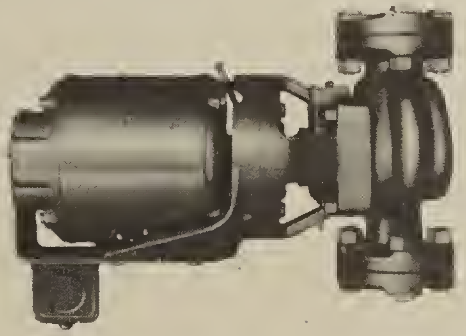
room temperature control, automatically circulates hot water throughout the system.

When the room thermostat calls for heat, the pump starts and almost immediately the radiators begin to warm the rooms—not merely the radiator nearest the boiler but all radiators, because there is rapid circulation of hot water throughout the entire heating system. Thus the desired room temperature is maintained within a very close range.

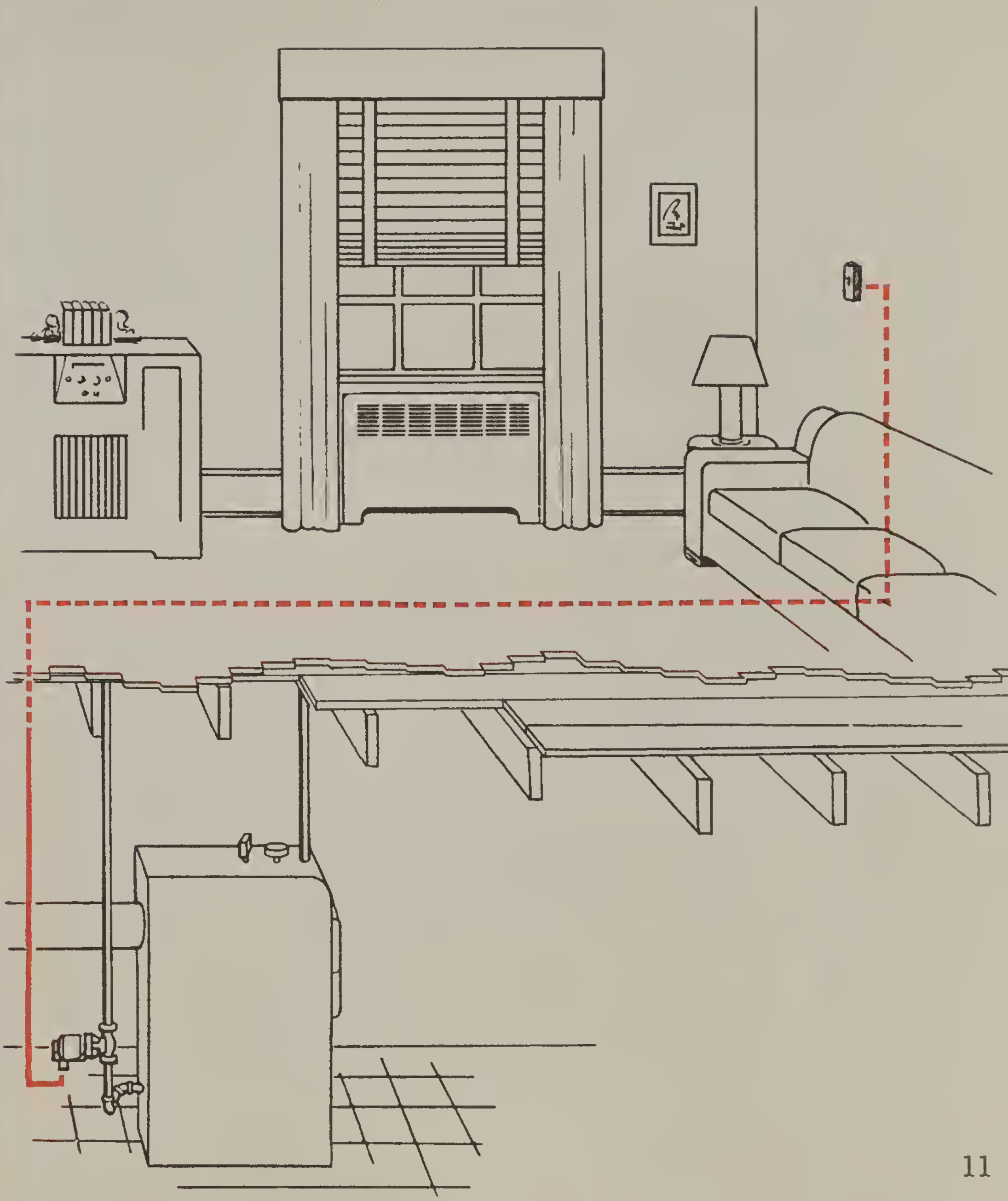
In addition, a plentiful supply of hot water for cooking, washing or bathing can be delivered at any season of the year bringing to the home owner a new and higher standard of comfort and convenience.



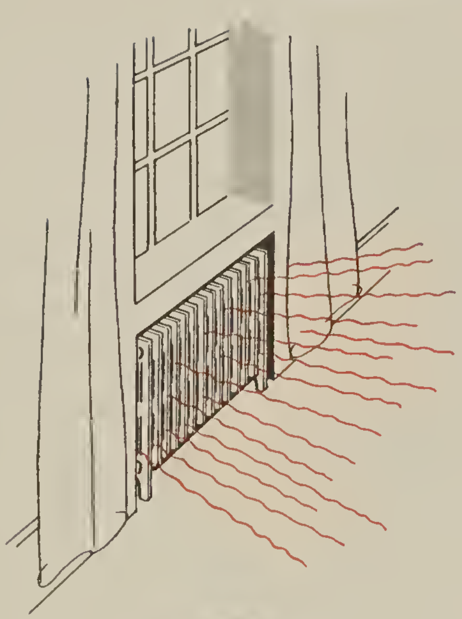
Desired room temperature automatically maintained by a neat wall thermostat.



Motor-driven pump, controlled by the thermostat, promptly circulates hot water through radiators or convectors.



What is Radiant Heating?



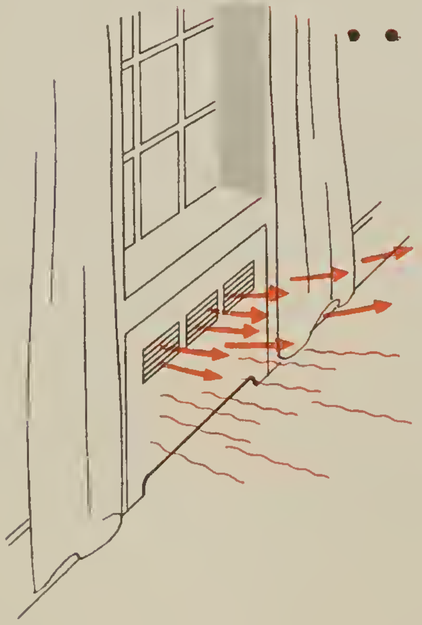
Radiant heat is transmitted by unseen rays spreading out from any heated surface, which become heat only after they have been absorbed by the body or other objects.

The sun is the most common example of radiant heat. Its warmth may be felt, outdoors, even when the temperature of the air is below freezing.

In the home, the radiator is an excellent and probably the best-known source of radiant heat. Others include walls or floors heated by concealed pipes carrying hot water or steam—or the new radiant baseboards also heated by water or steam.

A distinct advantage of radiant heat is the constant delivery of healthful warmth without drafts.

. . . and Convection Heating?



Convection heating is the transmission of heat by the natural circulation of warm air over a heated surface, based on the principle that warm air rises.

The comfort of this type of heating is enjoyed in the home from the use of convectors placed under the windows or at other points of cold air leakage. Room air circulates through the convector slowly and without the aid of fans or the creation of drafts. Thus, adequate, gentle warmth is delivered to the room at the proper level.

Considerable radiant heat also is provided from the surface of a convector and its attractive metal shield or enclosure.

is Automatic Heating important?

Would you want to crank your automobile—now that you have become accustomed to the convenience of self-starters?

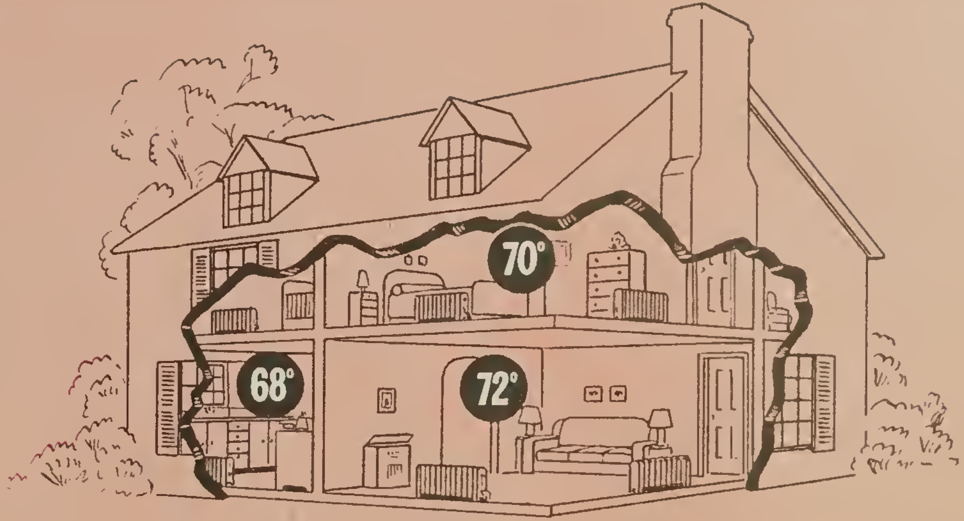
Or consider those who, prior to the war, enjoyed the convenience and luxury of automatic heating and a plentiful supply of hot water—and then patriotically converted to hand-fired heating. Ask them if they would prefer to continue hand-firing and give up, permanently, automatic heating convenience? Definitely, they will state they had not realized before how much automatic heating had contributed to the full enjoyment of home life.

Whether it be with oil, gas or stoker-firing, automatic heating provides unbelievable freedom from drudgery, dirt and inconvenience.

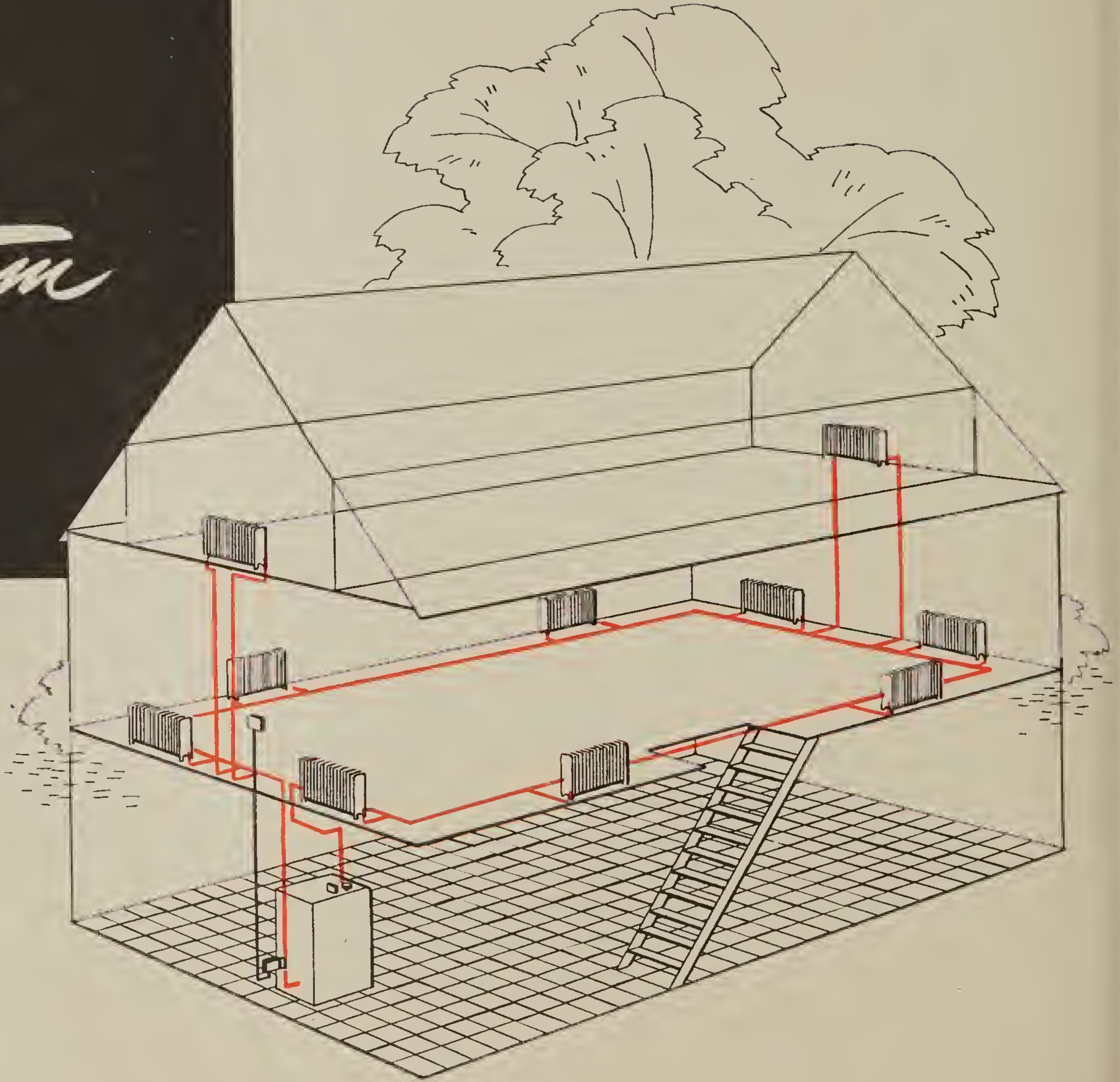
Zone Control

Zone control, employing several separate thermostats and accessories, automatically maintains different temperatures in various parts of a building. For instance, it eliminates overheating in kitchen or bedrooms when a higher temperature is required in the living room . . . or it provides adequate warmth in an exposed wing without overheating the sunny or sheltered side of a house.

Zone control is efficient, economical and may be applied to existing or new heating systems.



Why is a *Central Heating System* important?



Central heating installation, with or without forced circulation, in a basement type house.

A central heating system is designed to heat an entire house and is "tailored" to the individual home. A central heating system with radiant units delivers a definite amount of warmth where needed—at windows and other areas of cold infiltration, and thus assures uniform distribution to all portions of the room.

Homes without basements can be equipped with a central heating system to provide the comfort of radiant unit heating by installing the boiler and domestic hot water equipment in a utility room—usually located on the first floor. Pipes to the radiant units are run under the floor. Hot water is circulated by means of an automatically controlled pump.

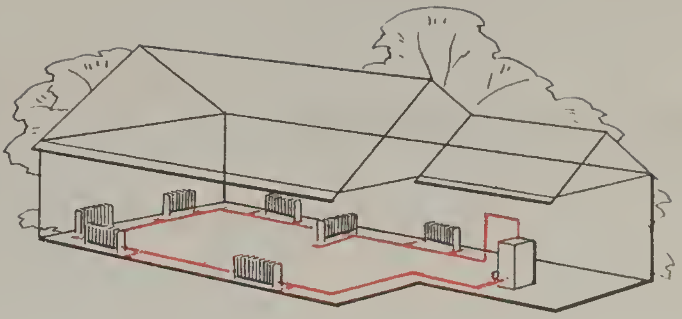
Other types of heating systems using individual heaters have restricted distribution in the circulation of heat. Uneven heating—overheated spots in one or more areas and cold zones near windows—means drafts and chills.

A A hot water system with circulating pump provides central heating in a basementless house.

B Single outlet heating systems give widely varying temperatures . . . overheating or chilliness.

C A room heater does not provide even heat distribution—particularly if used to heat several rooms.

A



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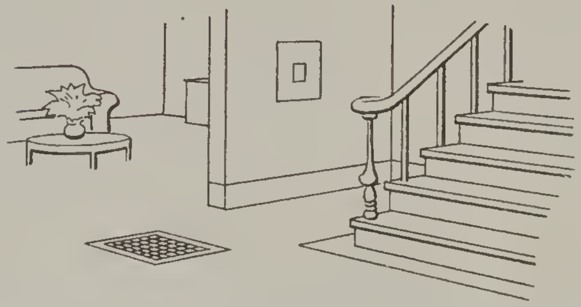

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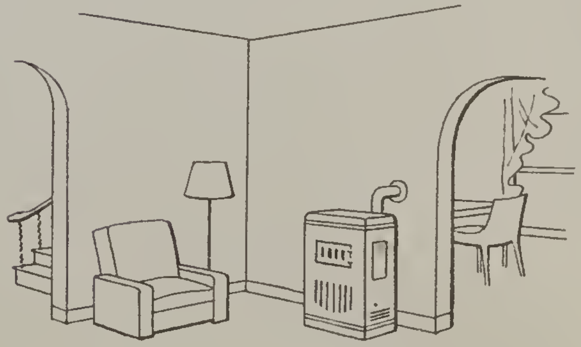
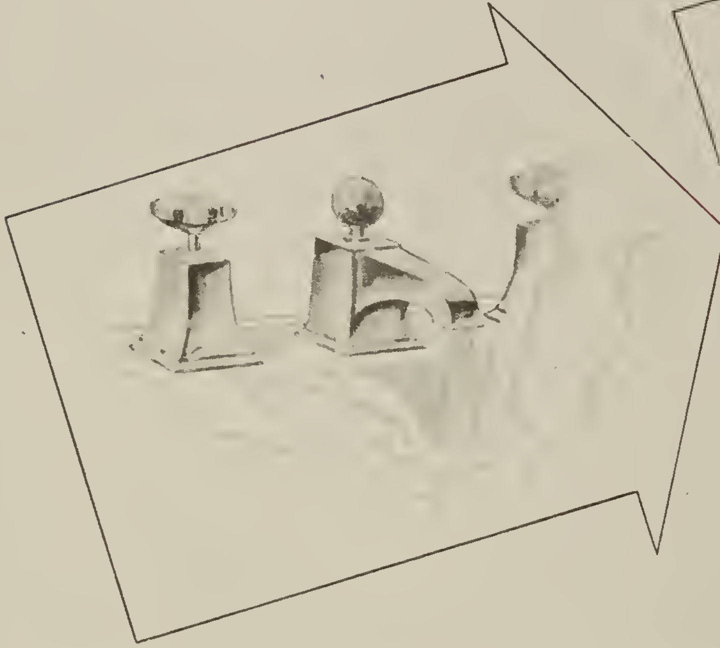
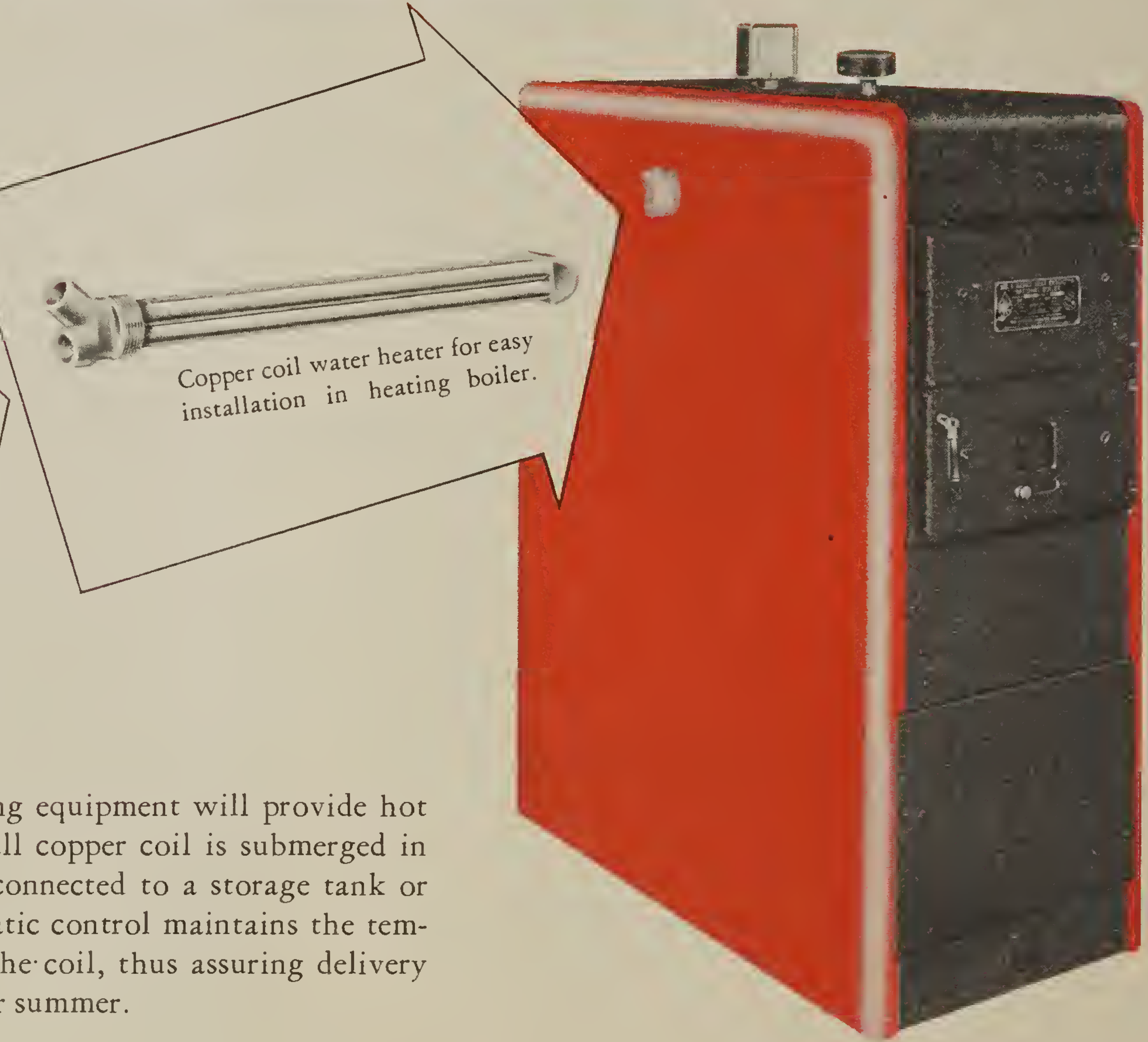


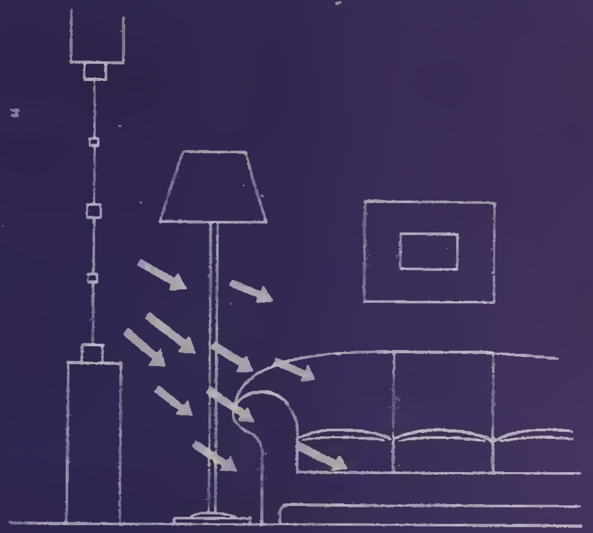
Can the Domestic Hot Water Supply be obtained from the Heating Equipment?

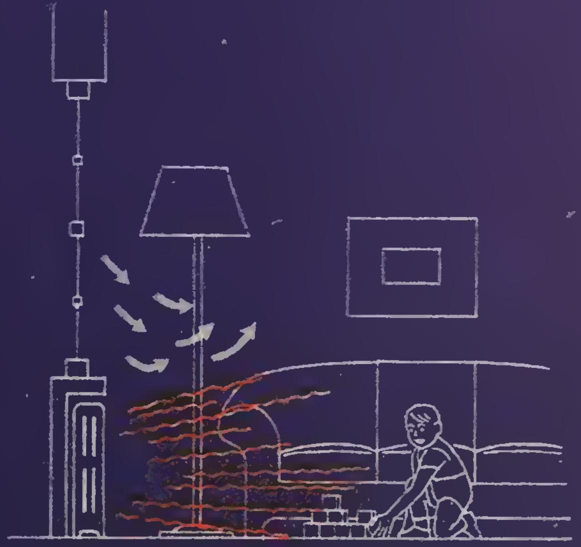




Copper coil water heater for easy installation in heating boiler.

Emphatically yes, steam or hot water heating equipment will provide hot water for kitchen, bath and laundry. A small copper coil is submerged in the hot water in modern boilers. This coil is connected to a storage tank or directly to the hot water faucets. An automatic control maintains the temperature of boiler water circulating around the coil, thus assuring delivery of an adequate supply of hot water—winter or summer.



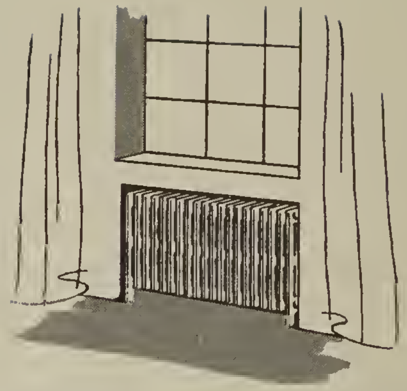


Is it Necessary

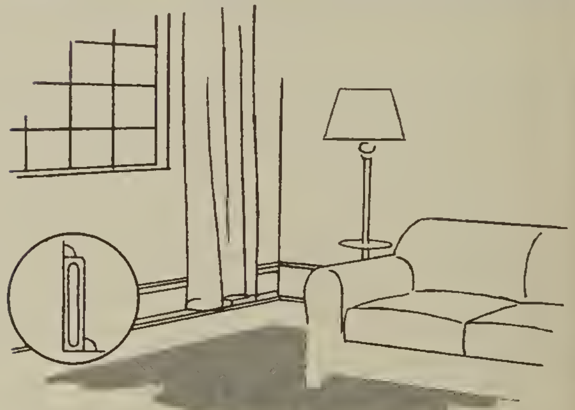
to place radiant units under windows?

The locations at which heat is introduced into a room are important to heating comfort. Remember that warm air rises —cold air descends. Inasmuch as the air in a room is chilled by heat loss through cold window glass and because of air leakage around the windows, it is advisable to intercept the cold air and warm it as it filters in, and before it forms a chilly "layer" of air at ankle level. With radiant units under the windows, the entering cold air is heated by the rising warm current of air from below, and is then circulated upward and throughout the room. In addition to the natural circulation of heated air, radiant heat waves reach all parts of the room, particularly at ankle and sitting levels. These modern, trim, radiant units can be placed unobtrusively in recesses under the windows.

There are many ways to Distribute Heat



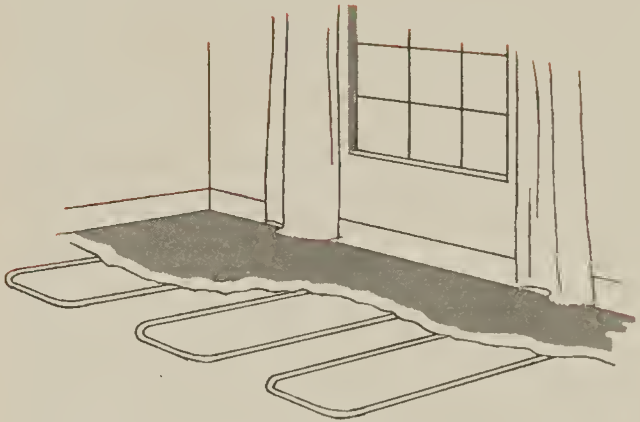
The "under the window" method of introducing heat, to offset cold air infiltration, is compared with several other methods in these illustrations.



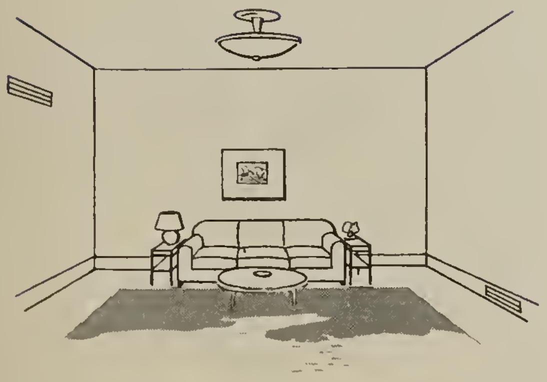
Radiant baseboard heating is the newest method. Hollow metal panels replace ordinary wood baseboards. Hot water or steam flowing through these units provides radiant warmth and uniform temperature without floor drafts.

When remodeling, if framing construction does not permit recessing, the modern low, slim, radiant unit can be placed in front of the windows. Very little room is required, and draperies can be hung conveniently at the windows.

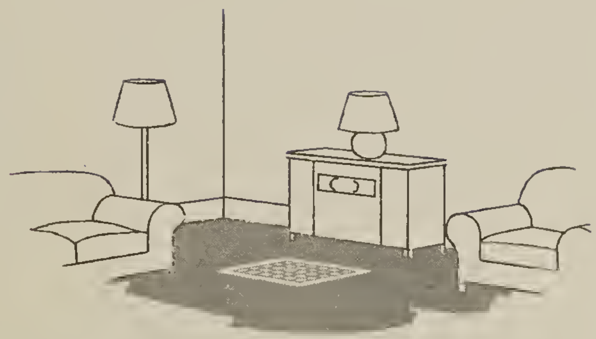
A convector is recessed behind an enclosure or panel which usually is flush with the adjoining wall areas. Radiant and convected warmth are distributed throughout the room, and cool floor drafts are avoided.



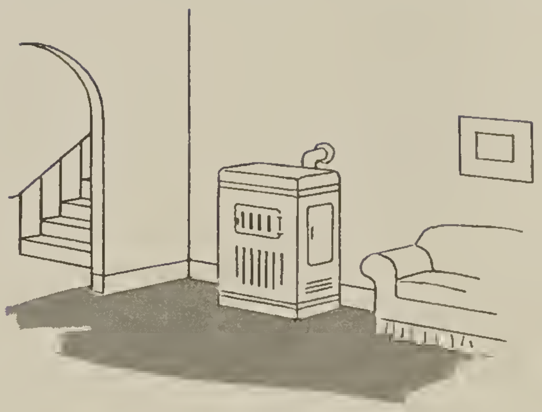
Radiant heating from the floor, ceiling or walls employs pipe arrangements under the floor or within specially designed wall framing or ceiling construction. Hot water or steam is circulated through these pipes.



Warm air systems discharge heated air and withdraw cold air through registers located in the wall, baseboard or floor. If cool air is to be introduced in summer, outlets should be located in the wall about 6 feet above the floor.



Floor heaters or pipeless furnaces are placed under a large floor register. Obviously the greatest heat is concentrated in the vicinity of this register.



Space heaters are modernized "parlor" stoves located in a room which permits a fluepipe connection to the chimney. Some spots may be too warm—others too cool.

Comfort and Beauty

at the Cold Window Zone

Many women prefer the greater comfort of radiant warmth, but are doubtful about decorative treatment of windows. They recall bulky, old-fashioned radiators but are unfamiliar with the new, streamlined radiant units.

Whether windows throughout the home are of the "vista," bay, corner, or casement type—recessed radiant units can be installed without any interference with draperies.

The sensation of radiant heat is most appreciated in the bathroom. When stepping from tub or shower, the gentle warmth from a radiant unit avoids the unpleasant chilliness that may be created by circulating air.

Important Considerations

in selecting the Heart of the Heating System

—the Boiler

All other parts of the heating system may be adequate but, if the boiler does not meet the heating requirements of your home, insufficient heat, high fuel costs and dissatisfaction will result.

Be sure that the boiler has enough capacity to provide the temperature desired in the coldest weather . . . and also furnish an ample supply of hot water for the bathroom, kitchen and laundry.

Whether the boiler is of cast iron or steel construction, you are protected with safeguards if you insist upon having guaranteed capacity ratings. These recognized ratings are known as "I-B-R" (Institute of Boiler and Radiator Manufacturers) for cast iron boilers and "S.B.I." ratings (Steel Boiler Institute) for steel boilers.

The "Heat Extractor" Series of National Boilers are of the latest and most advanced design obtainable for steam or hot water heat, and for hand, stoker, oil or gas firing. They combine time-proved principles with adequately tested improvements to provide the newest and most economical series of boilers available for up-to-date heating service. Some models are designed exclusively for automatic oil or gas firing with a selection in cast iron or modern steel construction. Preference for cast iron or steel is really a matter of personal choice, as both will give dependable, long life service.

50 Years of Experience

The Company's first product was a radiator introduced in 1894. Since then, National Radiator has had the distinction of leading the industry in many new heating developments and of being often the first to introduce products with patented features as a contribution to the American home owner's greater comfort. Special war work and precision-made industrial products have emphasized the skill of National employees in producing quality equipment.

A laboratory, for research and development engineering in which National Radiator products are constantly being tested, is augmented with field tests to furnish National engineers with a sound knowledge of the practicability of new improvements.

These investigations are supplemented by long-range research developments resulting from a Fellowship maintained at Mellon Institute of Industrial Research.

Like other reputable manufacturers, The National Radiator Company has active memberships in the several organizations promoting better codes and standards. Among these is the Institute of Boiler and Radiator Manufacturers which operates a research home at the University of Illinois. Here, under actual living conditions, methods of heating are tested by engineers. Others are the Steel Boiler Institute, the Indoor Climate Institute, the Oil-Heat Institute of America and the Association of Gas Appliance & Equipment Manufacturers.

When New Heating Methods or Equipment Have Proved Their Value—National Will Provide Them!

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Plan to be Comfortable

by following this guide to better heating comfort

Whether you intend to modernize your heating system or select equipment for a new home, we feel that the information in this booklet will assist you. Important considerations to remember are:

The overall system selected to provide your indoor comfort should heat each room uniformly and to individual requirements. It should supply warmth at the floor level and at cold wall and window areas to prevent unhealthful drafts. It should offer convenience, ease of operation and life-time economy with low maintenance cost. You should consider its ability to supply domestic hot water.

Related to all these considerations is the necessity of a system that has been designed for the size, type, location and comfort demands of your particular home.

The specialized knowledge of a contractor, experienced in good heating practice is your assurance of obtaining the right design.

Demand equipment which has been thoroughly proved over a period of years and is guaranteed by a reputable manufacturer.

Specify National Radiator Products for Indoor Comfort and Better Living

THE NATIONAL RADIATOR COMPANY

JOHNSTOWN, PENNSYLVANIA

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